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Review Article

Wetlands in the EU policy context

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Abstract

This paper provides an overview of the EU policy context relevant to wetlands, assessing EU legislations that support or counteract wetland conservation, restoration and sustainable use. We classify selected EU environmental and climate policies according to their impacts and reliance on wetlands and assess prevailing implementation weaknesses of their wetland-related aims. The second part of the assessment focusses on the new EU Nature Restoration Regulation, finding that it can serve as a focal point for synergetic action, promoting wetland restoration while enhancing benefits for biodiversity conservation, climate change adaptation and mitigation, flood risk management, water resilience and other policy objectives. The success of the Nature Restoration Regulation will depend on its effective implementation in EU Member States through ambitious and well-funded National Restoration Plans. To further improve policy coherence and enhance the health of wetlands in Europe, systemic changes are needed in policy sectors currently driving wetland degradation, including the Common Agricultural Policy.

Highlights

- Nature and water policies in the EU are supportive of wetland conservation and rely on high quality wetlands to meet their aims.
- The CAP, as the biggest fund for land management, needs significantly better targeting to reduce continued wetland damage and promote wetland conservation.
- The EU Nature Restoration Regulation introduces legally binding, time-bound restoration targets, a legislative milestone for wetland restoration.
- The NRR's success depends on political will, funding, and cross-sector coherence to effectively deliver synergies for biodiversity, climate, disaster risk reduction and water resilience.

Key words: coherence, nature conservation, policy implementation, Nature Restoration Regulation, synergies

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Introduction

Wetlands fall under multiple policy-areas: water management, species and habitats conservation, climate change mitigation and adaptation, agriculture, and more. Given this cross-cutting nature, wetlands are affected and governed by a complex web of legislative instruments from these different topic areas, also referred to as policy mixes (Rogge and Reichardt 2016).

On a global level, the cross-cutting importance of wetlands is acknowledged in a range of international agreements. The Ramsar Convention on Wetlands focusses specifically on these ecosystems and promotes their protection, restoration and wise use. Moreover, healthy wetlands provide key contributions to the targets of the Convention on Biological Diversity (CBD) and the Kunming-Montreal Global Biodiversity Framework, the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement, the United Nations Convention to Combat Desertification (UNCCD) and the Sendai Framework on Disaster Risk Reduction, the UN Water Convention, the Sustainable Development Goals, as well as initiatives like the United Nations Decade on Ecosystem Restoration and the Freshwater Challenge (see Fig. 1). Together, these policies set a broad framework to protect, restore, and sustainably manage wetlands, promoting biodiversity and ecosystem services crucial to combating and adapting to climate change and supporting sustainable development.

In Europe, the management of wetlands is typically impacted more directly by the EU policy framework than by global conventions. Therefore, we take this as our focus for the following analysis. Here, we aim to provide an analysis of the current EU policy landscape relevant to wetlands, highlighting both supportive and counteracting legislative developments as well as implementation challenges. Starting from the EU Green Deal as an overarching umbrella, we briefly examine the EU Biodiversity Strategy and then focus on the new EU Nature Restoration Regulation, its targets and potentials. Based on this, we offer recommendations for enhancing policy implementation, facilitating greater integration across sectors, and accelerating progress towards protecting, restoring and accelerating sustainable wetland management in Europe.

Assessing the EU policy mix relevant to wetlands

As a first step to assessing the current EU environmental policy mix, the range of policy instruments related to wetland management, were identified. Included are only legally binding instruments which impact wetlands either directly or indirectly, e.g. by affecting land and water use, or which rely on high quality wetlands to meet their aims. From this list of instruments, the eight most relevant to wetlands were selected, as presented in Table 1.

The table summarizes each policy's wetland-related aims, their influence and reliance on wetlands. It also identifies weaknesses in the policies that impede their implementation. The analysis is based on both expert judgement and literature review, drawing on broader scientific assessments (e.g. carried out by Hering et al. 2023) as well as EU reports (including e.g. the Fitness Check of EU Nature Legislation (EC 2016) and the recent State of Water in the EU Report (EEA 2024b). The recently adopted EU Nature Restoration Regulation is not included in Table 1 but discussed separately in the section thereafter.

Table 1. Selected EU policies relevant to wetlands, before the adoption of the Nature Restoration Regulation. The weaknesses and practical challenges hindering a successful implementation of the policy's wetland-related aims were identified by our work, yet in most cases completed by the extensive research that was carried out by Hering et al. (2023).

Policy category	Policy name	Wetland-relevant aims	Influence on wetlands	Reliance on wetlands *Does this policy rely on healthy wetlands to achieve its aims?*	Weaknesses *Which 1) weaknesses in the policy and which 2) practical challenges hinder the implementation of its wetland-related aims?*
Nature policies	Birds Directive	Protection of wild birds in the EU. Establishes Special Protection Areas (SPAs, as part of the Natura 2000 network) to maintain or restore the habitats of rare or vulnerable breeding and migratory bird species, giving particular attention to wetland habitats	Supports protection, restoration and sustainable management of wetlands as bird habitats	High reliance, as many bird species depend on wetland habitats for breeding, feeding, and migration	1. Policy weaknesses. Lacking or weak political commitment and support (Hering et al. 2023). Absence of legal deadlines for reaching favorable conservation status (Sanderson et al. 2015). Insufficient policy integration (EC 2016). Exceptions to the Directives, e.g. Hydropower projects in in Natura 2000 sites (EC 2018). 2. Practical challenges. Lack of suitable, available and targeted funding and funding mechanisms (Hering et al. 2023). Human resource constraints, lack of skills of management staff (Hering et al. 2023; EC 2016). Communication barriers between authorities and stakeholders (Hering et al. 2023), lack of full stakeholder engagement. Ineffective management and connectivity of Natura 2000 sites. Lack of data for the assessment of sites (Hering et al. 2023). Pressures from urban and infrastructural development on land and nature (Kati et al. 2014)
	Habitats Directive	Conservation of natural habitats and wild fauna and flora species in the EU. Designates species and habitats of community interest, including over 30 wetland habitat types and several species occurring in wetlands; obliges Member States to assess, protect and restore them to a favourable conservation status. Establishes Special Areas of Conservation (SACs, as part of the Natura 2000 network) for these habitats and species	Supports protection, restoration and sustainable management of wetland habitats and wetland-dependent species	High reliance, since implementing this directive explicitly requires reaching a favorable conservation status of the listed wetland habitats and species of community interest	
Water management policies	Water Framework Directive (WFD)	Achieve good chemical and ecological status of ground and surface water bodies. Promotes sustainable water use and protection of aquatic ecosystems. Member States must develop River Basin Management Plans (RBMPs) and Programmes of Measures (PoMs) to protect and restore water bodies, ensuring good chemical and ecological status	Protection and restoration of wetlands in integrated river basin management planning Improvement of water quality standards	High reliance, despite the fact that wetlands beyond water bodies do not explicitly fall under the WFD's scope, because wetlands play a crucial role in regulating water quality and ecosystem health.	1. Policy weaknesses. Underestimated ecological timescales (Hering et al. 2023). Lack of governance tools to address main stressors affecting ecological status (Hering et al. 2023). Ineffective integration of sectoral policies, especially agriculture, navigation, and energy (EC 2019b; Voulvoulis et al. 2017). Excessive use of exemptions by EU Member States ignoring concepts such as non-deterioration principle (Boeuf et al. 2016; Hering et al. 2023). Scope does not include small water bodies and wetlands. 2. Practical challenges. Inadequate funding. Slow implementation of measures due to conflicts with other land and water uses (e.g, hydrowpower) (Hering et al. 2023). Lack of European-wide monitoring data (not comparable, not centrally stored, too few sites) causes delays in detecting emerging stressors and long-term trends (Hering et al. 2023). Varying interpretations of WFD's objectives (Boeuf et al. 2016)
	Marine Strategy Framework Directive (MSFD)	Protection of marine ecosystems. The MSFDs scope includes transitional ecosystems (estuarine ecosystems) under the obligation to achieve Good Environmental Status (GES).	Required measures are put in place to achieve GES. Promotes coherence with other nature and ocean-related policies.	Low reliance: The MSFD applies to coastal waters as defined by the WFD and therefore there is a minor geographical overlap, but the MSFD only applies to the practical aspects of environmental status that are not already covered by the WFD. The MSFD explicitly limits its scope to the border of the WFD, which is a more effective tool to conserve and restore wetlands.	1. Policy weaknesses. Not the most useful tool for wetland conservation due to limited scope.. Underestimated ecological timescales (Hering et al. 2023). Underestimation of time needed for a change in human activities (Hering et al. 2023). Lack of governance tools to address main pressures (Hering et al. 2023). 2. Practical challenges. Lack of European-wide monitoring data (not comparable, not centrally stored, too few sites) causes delays in detecting emerging stressors and long-term trends (Hering et al. 2023). Definitions of objectives and requirements of MSFD and other directives are not always consistent (Hering et al. 2023). Potential synergies in monitoring systems from different directives are not well exploited (Hering et al. 2023).
	Floods Directive	Reduction and management of flood risks. Member States must develop flood risk management plans for their catchments that consider natural retention measures and the restoration of floodplains	Recognizes wetlands' role in natural flood management. Promotes the use of wetlands in mitigating flood risks. Coordination with WFD and achievement of environmental objectives	Moderate reliance, as wetlands are integral to natural flood defence strategies.	1. Policy weaknesses. Lack of spatial consideration of flood risk management. Ineffective integration of flood risk management across other sectors (van Ruiten and Hartmann 2016). Neither aquatic biodiversity nor ecosystem services are directly mentioned (Directive 2007/60). 2. Practical challenges. Insufficient transparency and communication between policy-makers and society (Rauter et al. 2019). Reliance on gray infrastructure solutions (e.g. dams and dikes) and reluctance to deploy blue-green infrastructure and nature-based solutions, especially at larger scale (EEA 2024b).

Policy category	Policy name	Wetland-relevant aims	Influence on wetlands	Reliance on wetlands *Does this policy rely on healthy wetlands to achieve its aims?*	Weaknesses *Which 1) weaknesses in the policy and which 2) practical challenges hinder the implementation of its wetland-related aims?*
Agri-cultural policy	CAP	Overarching focus on agricultural productivity is often counteracting wetland conservation. One of the specific objectives of the CAP 2023-27 includes halting and reserving biodiversity loss (SO 6) – how this is implemented depends on National CAP Strategic Plans"Enhanced conditionality" for direct payments (Pillar 1 funding): Good Agricultural and Environmental Conditions (GAEC) 2 aims to protect wetlands and peatlands by setting new minimum standards, but leaves much flexibility to Member States. GAEC 4 aims to enhance water quality through mandatory buffer strips.	Massive driver in supporting intensive agricultural use and continued degradation of drained (former) wetlands through direct payments. However, practices that protect and restore wetlands and support water retention are eligible for funding under CAP 2023-2027:- Eco-schemes provide Pillar 1 funding for practices with environmental and climate benefits that go beyond conditionality requirements;- Agri-environmental-climate-measures (AECMs, Pillar 2) provide financial incentives for environmentally friendly practices such as preserving natural vegetation. Paludiculture (wet use of peatlands) is not ineligible for direct payments anymore	Overall low reliance (but high impact!), yet the role of wetlands for regulating water availability for agriculture and improving resilience to droughts and floods becomes increasingly relevant in the face of climate change	1. Policy weaknesses. Conflicting objectives and land use priorities, with economic interests overshadowing environmental priorities (Hering et al. 2023). Failed to integrate EU and international biodiversity targets (Hering et al. 2023). GAEC 2 does not forbid continued drainage and ploughing of wetlands under agricultural use, and even allows new drainage if in line with existing national planning provisions. Member States are allowed to delay implementing GAEC 2 until 2025. 2. Practical challenges. Wetlands may not be a priority among supported AECM's. AECMs have insufficient budgets (Hering et al. 2023). Agri-environment scheme activities that could benefit wetlands not supported in all MS. Making GAEC exemptions is facilitated for MS. Not all MS chose to make land under paludiculture eligible for direct payments. Funding for biodiversity-friendly measures insufficient compared to subsidies for agricultural production (Rouillard et al. 2026). Poor balance between business as usual and biodiversity-friendly farming (Hering et al. 2023). Lack of mechanism to compensate farmers who dedicate land for nature restoration (Hering et al. 2023).
Climate policy	LULUCF Regul-ation	Regulates the accounting of greenhouse gas emissions and removals from the land use, land use change and forestry sectorSets a union target for net greenhouse gas removals of 310 million tonnes of CO2 equivalent by 2030	Sets requirements for accounting greenhouse gas emissions and removals from managed wetlands which will become mandatory as of 2026. Can potentially promote wetland restoration as nature-based solutions for emission reductions	High reliance, since degraded wetlands (e.g. drained peatlands) emit significant amounts of greenhouse gases, while protecting and restoring functional wetlands can enhance carbon sinks	1. Policy weaknesses. Links with EU biodiversity policy remain weak. 2. Practical challenges. Overall union target unlikely to be met (EEA 2025b). Insufficient ambition in implementation by EU MS (EEA 2025b). Technical complexity of measuring emissions and removals from LULUCF activities (Springer and Bognar 2025), including from wetland management. Uncertainties regarding future estimates of land carbon sink capacities, with carbon removals potentially falling below expectations (Springer and Bognar 2025).
Renew-able Energy Policy	Renew-able Energy Directive	Promotes renewable energy sources. Generalised understanding of renewable energy as an overriding public interest - exempting the development of renewable energies from the usual Environmental Impact Assessment (EIA) and subject them to the much less stringent Strategic Environmental Assessment procedure.	High potential for negative impacts on wetlands through river fragmentation and habitat disruption, especially through hydropower expansion (barriers, hydropower plants and dams harm biodiversity greatly). Designation of "go-to areas" (Renewables Acceleration Areas) will fast track development and circumvent environmental protections such as the EIA procedure.	Low reliance: Directive's objectives are not dependent on wetlands	1. Policy weaknesses. Conflicts of interest between renewable energy production and biodiversity objectives. 2. EIA exemption for renewable energy projects aggravates biodiversity risks; especially from hydropower plants and dams Practical challenges. High potential to divert funds dedicated to climate to the development of grey infrastructure rather than nature-based solutions and lock-in on maladaptive practices

The term wetland is understood very broadly in the context of this analysis, including the full spectrum from natural, functioning wetland ecosystems (e.g. salt marshes and seagrass meadows, river floodplains, riparian forests, bogs and fens) to heavily modified former wetlands that could potentially be restored (e.g. drained peat soils and disconnected floodplains). While rivers and lakes themselves are also typically classified as wetlands (e.g. under the Ramsar Convention's definition and in the LULUCF context), they are not the main focus of this analysis.

It should be noted that the selection of wetland-relevant EU policies presented in Table 1 is comprehensive, yet not fully exhaustive. For example, the EU's

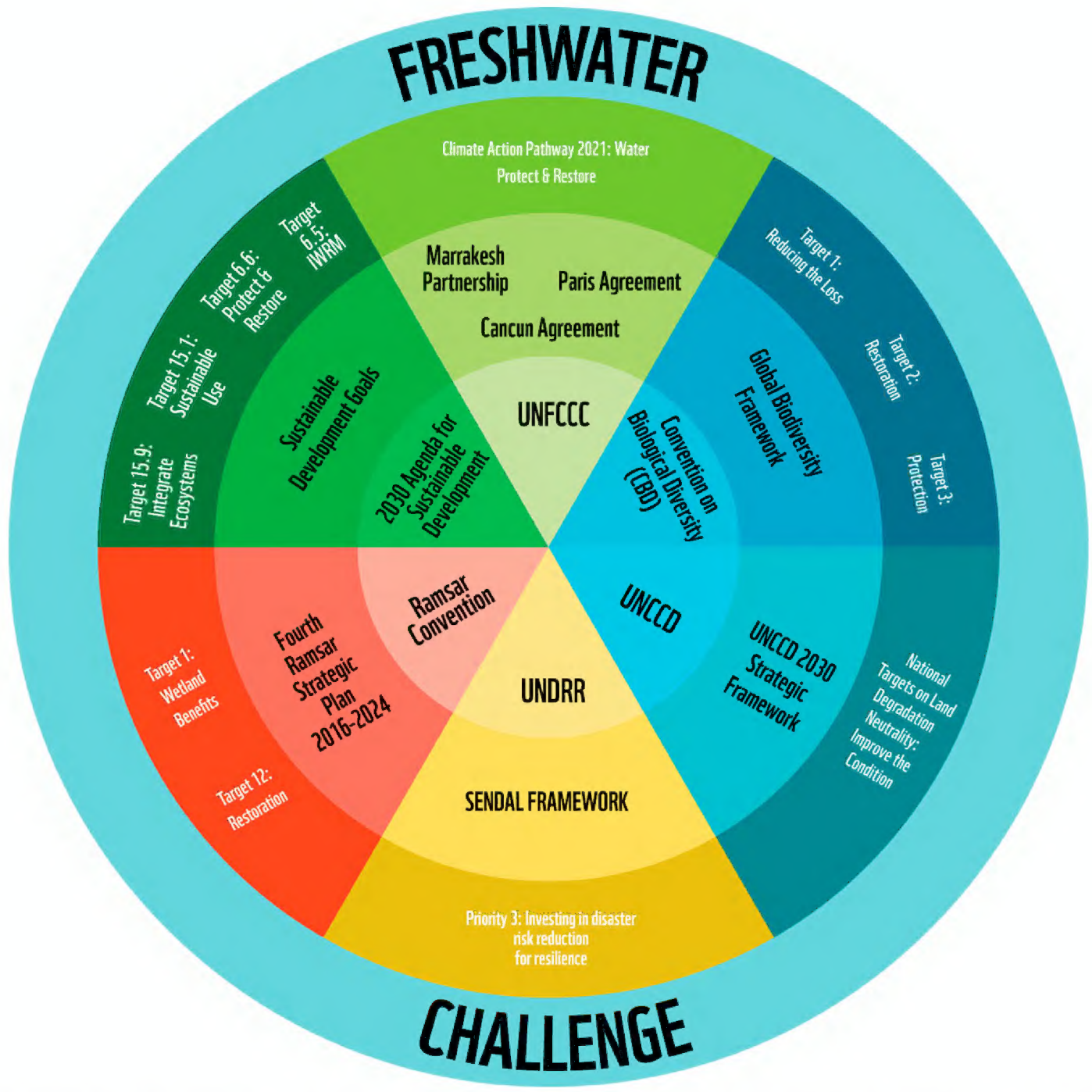

Figure 1. A collection of the most relevant international agreements for the sustainable management of wetlands. Visualisation is done by the Freshwater Challenge. The Freshwater Challenge is a country-led initiative to restore 300,000 km of degraded rivers and 350 million hectares of degraded wetlands by 2030, while securing the protection of freshwater ecosystems important for biodiversity and ecosystem services.

Common Fisheries Policy (CFP, based on Regulation (EU) No 1380/2013) was not included, despite its relevance in governing fishing and aquaculture practices that influence especially coastal and marine ecosystems. The EU's Trans-European Transport Network Policy (TEN-T, based on Regulation (EU) 2024/1679) was not analysed either (see Rosell et al. 2023 for recommendations on mainstreaming biodiversity in the transport sector by promoting green-blue infrastructure).

The following analysis distinguishes between those parts of the EU-level environmental policy mix that are clearly reliant on, and actively promote, wetland conservation and restoration (supportive policies) and those that have the potential to negatively impact wetlands and their ecosystem services (counteracting policies).

Supportive policies work towards shared goals in ecosystem health and resilience, facilitating wetland conservation or restoration either directly or indirectly. This includes the EU Water Framework Directive's aim to achieve good status of water bodies or the Habitats Directive protecting wetland related habitats. These policies are also typically reliant on the good condition of wetlands to achieve their aims.

Counteracting policies, however, include areas where land use and sectoral priorities clash/conflict with conservation goals, as seen in certain aspects of agricultural policy or renewable energy expansion. These policies can be described as policies which impact on wetlands without this necessarily being a key aim of the policy.

Identifying these synergies and conflicts allows for a nuanced understanding of policy effectiveness and the specific challenges that arise in balancing sustainable wetlands management with other objectives as well as specific challenges in policy implementation.

Supportive policies

Expanding on the analysis in the table, we here go into more detail, focusing on key policies that rely on high quality wetlands to meet their aims and hence support the conservation and restoration of wetlands, their biodiversity, and their climate change mitigation and adaptation services. We describe the policy mix before the Nature Restoration Regulation was adopted and consider what main synergies and difficulties exist in implementing these policies.

Nature policies

The Birds Directive (Directive 2009/147/EC 2009) and Habitats Directive (Directive 92/43/EEC 1992), also known collectively as Nature Directives, form the cornerstone of EU biodiversity policy, mandating all EU countries to protect their most valuable and threatened biodiversity. The species and habitats listed in the annexes of the Directives include numerous wetland habitats (such as specific types of coastal and salt habitats, wet heaths and wet forests, mires, bogs and fens), a large variety of wetland-dependent migratory or breeding birds as well as several other wetland species (such as the European otter (*Lutra lutra*), European sturgeon (*Acipenser sturio*) and marsh fritillary (*Euphydryas aurinia*)). To meet the objectives of the EU Nature Directives, all of these habitats and species must be maintained or restored to favorable conservation status. Hence, these two directives present one of the strongest policy levers to drive wetland action across Europe.

The Commission's Fitness Check (EC 2016) of the Nature Directives carried out a full assessment of these directives and reveals that they are still fit for the purpose of implementing conservation instruments across the EU. Where the Directives are fully and properly implemented, establishing the Natura 2000 network has been particularly successful in reducing pressures on biodiversity and facilitating the recovery of habitats and species. This is evidenced by slower rates of species decline, especially Annex I bird species (Sanderson et al. 2015) and mammals (Deinet et al. 2024), and habitat loss within these protected areas compared to non-protected areas (EC 2016). Additionally, the Directives have increased public awareness and stakeholder engagement, which have been crucial in integrating conservation efforts with socio-economic activities. Nevertheless, the Directives face challenges (see table) that hinder their effective implementation, including a lack of legal deadlines for meeting their targets.

Data from the latest finalised reporting period (2013–2018) shows clearly that the general objectives of the Directives have not yet been met. Only 17% of protected freshwater habitats, including river, lake, alluvial and riparian habitats, achieve 'good conservation status' while this number is even smaller for coastal habitats. High proportions of protected fish (80%) and amphibians (60%) reliant on these habitats are in poor or bad conservation status, demonstrating the risk of becoming locally extinct (EEA 2020). Regional trends in Europe are particularly pronounced with freshwater migratory fish species showing a decline in abundance of -75% since 1975 (Deinet et al. 2024).

Water management policies

The Water Framework Directive (WFD) (Directive 2000/60/EC 2000), adopted in 2000, aims to achieve good status for all water bodies by 2027 at the latest. It applies to inland, transitional, and coastal surface waters, as well as groundwaters, promoting an integrated approach to water management that respects the integrity of entire ecosystems. As the Directive also protects aquatic ecosystems, its implementation would highly benefit European wetlands.

Yet, only 37% of Europe's surface water bodies achieved a good or high ecological status in 2021 (EEA 2024b). The main pressures on water bodies are changes to natural water flow, such as damns and channelization, which negatively impact natural habitats, as well as pollution from different sources such as agriculture (EEA 2024b). Weaknesses identified by the Commission's Fitness Check and others are collected in the table above.

To improve the integration of nature conservation objectives in river basin management, NGOs recommended that nature conservation authorities prepare and present a three-year plan to the Commission which contains measurable on-site conservation objectives for all relevant freshwater habitats and species (Wetlands International Europe 2022). Further recommendations include that the Commission initiates infringement processes against Member States that fail to incorporate conservation objectives into the third cycle of RBMPs. It is hoped that better legal enforcement, aligned with the next WFD implementation analysis, will ensure that conservation goals are prioritized and integrated into water management plans (Wetlands International Europe 2022).

The EU Floods Directive (Directive 2007/60/EC 2007) promotes flood risk approaches that recognize the ecological and hydrological benefits of wetlands such as their ability to function as natural water retention areas that absorb and slowly release floodwater. In doing so, the Directive complements the WFD and holds potential to promote a paradigm shift from flood protection to flood risk management as well as integrated water management in the EU (Dieperink et al. 2013). However, this potential has not been realized so far, as gray infrastructure approaches (e.g. river dykes) remain the norm (Rauter et al. 2019).

Climate policy

European climate legislation is also relevant in shaping the policy context for wetland management in the EU. Firstly, the European Climate Law (Regulation (EU) 2021/1119) aims to make the European Union climate-neutral by 2050,

setting a union-wide target of reducing net greenhouse gas emissions by at least 55% in 2030 compared to 1990 levels. Its implementation is closely interlinked with the Governance Regulation (Regulation (EU) 2018/1999), which establishes a governance mechanism to assist the EU and its Member States in meeting climate and energy targets for 2030, inter alia by requiring the development of National Energy and Climate Plans. In the context of wetland management, land-based climate action has the largest impact, affecting wetlands either negatively (e.g. through conflicting land requirements) or positively (e.g. through nature-based solutions).

The EU climate policy most directly linked to wetland management is the LULUCF regulation (Regulation (EU) 2018/841) (included in Table 1): a framework that governs how land use, land use change, and forestry (LULUCF) activities are accounted for in terms of their greenhouse gas emissions and removals. Its revision in 2021 set a union target for net greenhouse gas removals of 310 million tonnes of CO_2e by 2030. Further, the 2023 amendment also requires Member States to report on biodiversity trade-offs and synergies in their compliance reports (Regulation (EU) 2023/839, Article 13d (12)). Restoring wetlands (especially drained peatlands) as nature-based solutions has high potential for emission reductions and hence for achieving the regulation's objectives. Reporting on emissions from 'managed wetlands' (e.g. peat extraction sites) will become mandatory in the EU in 2026 under the LULUCF regulations. Emission reductions from rewetting peatlands under other land uses (e.g. grassland or cropland) can already be reported in the respective categories (see IPCC 2014 for international guidance).

In sum, various supportive legislative instruments exist in the EU that could promote sustainable wetland management. Yet although their aims are often complementary, bringing these different policy frameworks together is not as administratively simple as it should be. Even the definition and mapping of wetlands differs between EU policies. Promoting coherence between biodiversity and other environmental or climate policies is essential to harnessing synergies, yet requires political will, endurance and enhanced capacities (Fey et al. 2025). The main barriers to successful integration between the EU's existing nature and water laws, for example, include a lack of resources, funding, knowledge and time (EEA 2020)[20]. Often, existing funding is neither sufficient nor targeted well enough towards wetland restoration purposes.

Counteracting policies

Agricultural policy

A primary source of conflict in implementing wetland-related policies arises from the competition for land and water resources between agriculture and wetland conservation and restoration. The adverse impacts of intensive agriculture on wetlands and water are severe. Due to its high water use and the intensive discharge of nutrients and pesticides, the agricultural sector presents the most significant pressure for both surface and groundwaters in the EU, with little improvement since 2010 (Rauter et al. 2019). Likewise, the most severe pressures on protected wetland habitats in the EU include hydrological modification (e.g. drainage for agricultural use), pollution, as well as management practices such as agricultural activities that degrade the ecosystem's condition

(EEA 2020). Drained wetlands, especially peat soils, emit substantial amounts of CO_2 into the atmosphere (see also Ludewig et al. 2026 for the climate change mitigation potential of riverine and coastal wetlands).

The EU's Common Agricultural Policy (CAP) is the main EU funding instrument to support land use and land management changes (see Rouillard et al. 2026 for a detailed analysis of the CAP). Through numerous reforms, the CAP has evolved from its primary aims to enhance agricultural productivity and ensure a stable supply of food, to also include some biodiversity and climate objectives. The CAP is thus relied upon to support delivery of the objectives of EU environmental policies – yet in its previous funding periods has failed to deliver with respect to biodiversity, climate, soil and land degradation challenges (Pe'er et al. 2014; Pe'er et al. 2020). Rouillard et al. (2026) in this issue gives a full analysis of the potential effectiveness of the CAP measures selected by Member States under the current funding period (2023–2027) with regard to freshwater ecosystems.

While the current CAP is better structured to provide support to wetland management than its predecessors, inconsistencies remain in implementation (see Table 1) (Bouwma et al. 2019; Hodge et al. 2015). The majority of Member State's CAP strategic plans have been assessed as insufficient in delivering stated biodiversity and climate objectives (BirdLife International 2022) and water objectives (Rouillard et al. 2026). Overall, the effectiveness of agri-environment measures remains limited by the relatively small funding allocation and lack of targeting. Despite decoupling of agricultural payments, voluntary coupled support still allows payments to be linked to certain agricultural produce. The majority of agricultural funding through the basic payment scheme is at best an income support measure with weak conditionality. While the newly-introduced standard for Good Agricultural and Environmental Conditions (GAEC) 2 does offer some important minimum criteria for the management of wetlands and peatlands in the current funding period, many Member States have made use of its flexible 'loopholes' to delay implementation or set only weak national compliance criteria (see Fachini et al. 2025 for a detailed analysis).

Recommendations to improve the CAP's outcomes for wetlands include a more robust application of GAEC 2, the establishment of effective "no degradation" principles that ban new drainage and forbids renewal or deepening of drainage systems in peatlands and wetlands, as well as targeted support for sustainable wetland management and restoration measures (Fachini et al. 2025). However, it should be noted that the Commission's recent proposal for CAP funding for 2028–2034 is unlikely to improve the situation, placing a stronger focus again on production with weaker environmental checks and balances in place (Hart and Baldock 2025).

This makes it even more problematic that there is currently a strong reliance on the CAP for financing wetland restoration measures across most of the EU's land.

Renewable energy policies

The EU Renewable Energy Directive (Directive (EU) 2023/2413) aims to reduce the EU's greenhouse gas emissions with the binding target to achieve a 42,5% share of renewable energies until 2030. It obliges Member States to designate "renewable acceleration areas" which often conflict with nature conservation priorities (Searchinger et al. 2018; Bolonio et al. 2024). Due to habitat

disruption, land-use conflicts, visual as well as noise pollution, and resource competition, renewable energy projects can significantly disrupt ecosystem stability and impact wildlife and its habitats. The expansion of hydropower, in particular, can have detrimental effects on wetland biodiversity and drive river fragmentation (Wu et al. 2019). Still, investments in hydropower projects are classified as environmentally sustainable economic activities in the EU under the Taxonomy Regulation (Regulation (EU) 2020/852), though experts suggest that hydropower plants generating under 10 MW should be excluded due to their environmental impact (TEG 2020).

Underlying these conflicts between EU biodiversity policy and counteracting agricultural and energy policies is the still existing economic growth paradigm of the 20th and 21st century. Economic growth contributes to the global biodiversity crisis via increased resource and energy consumption as well as higher emissions, which in turn accelerate climate and land use change, the largest drivers of biodiversity loss (Otero et al. 2020). Therefore, better integration or mainstreaming of biodiversity into the EU policy sectors that currently drive its decline is of crucial importance to set nature on a path to recovery (Wulf 2024).

The European Green Deal and its Nature Restoration Regulation: a coherent policy mix for the future?

Above, we have described the EU policy mix relevant to and impacting wetland management, as prevailing during the EU's previous legislative period (2019–2024). As shown in Table 1, EU policies that support the conservation or restoration of wetland ecosystems suffered from implementation and enforcement challenges, lacked funding and remained undermined by counteracting policies such as a CAP failing to deliver on its environmental targets.

The need for environmental policy integration, or biodiversity mainstreaming, in the context of EU policies has been discussed in various formats for decades (e.g. Karlsson-Vinkhuyzen et al. 2018; Zinngrebe et al. 2022). As a response, the Commission introduced its European Green Deal in December 2019, soon followed by the EU Biodiversity Strategy for 2030 as an integral part of it (EC 2020). This presented a significant opportunity for policy integration, as various environmental and economic objectives are aligned in one overarching, cohesive framework. By embedding biodiversity goals within broader environmental and economic policies, the original intention of the Green Deal was to facilitate a more holistic and synergistic approach to policy-making, ensuring that actions in one area support and enhance outcomes in others (EC 2019a).

Likewise, the EU Biodiversity Strategy follows a broad and integrative approach, addressing various policy sectors (Wulf 2024). At its core stand concrete and measurable targets for the protection and restoration of ecosystems, including wetlands, as part of its broader goal to put Europe's biodiversity on a path to recovery. In contrast to the legislations presented in Table 1, the strategy is non-binding in nature, yet it aims to support the implementation of existing binding legislation, especially the Nature Directives. For example, it encourages Member States to formulate voluntary "pledges", in order to meet the goals to protect at least 30% (10% strictly protected) of both the EU's land and sea area, and to ensure that at least 30% of species and habitats not currently in favorable conservation status reach this category by 2030. However, all Mem-

ber States missed the original deadline for the submission of plans on how to achieve these goals (Wetlands International Europe 2023). The Strategy also included a commitment by the EU Commission to introduce a Nature Restoration Law that turns the Strategy's nature restoration targets into actionable and legally binding commitments for EU Member States.

This Nature Restoration Regulation (NRR - Regulation (EU) 2024/1991) entered into force in August 2024. It is the first EU-wide law of its kind prioritizing ecosystem restoration within and beyond the Natura 2000 network. It follows a two-step approach, combining one overarching and several ecosystem-specific targets. Its overall EU-level target is to put in place effective and area-based restoration measures that jointly cover at least 20% of land areas and at least 20% of sea areas by 2030, and all ecosystems in need of restoration by 2050 (NRR Art. 1 (2)). This overarching objective is complemented by quantitative, legally binding targets that focus on different ecosystem types. Importantly for sound implementation, the targets are bound to specific timetables for their implementation.

Article 4 stands at the heart of the NRR. It sets targets for the restoration of terrestrial, coastal, and freshwater ecosystems to good condition, specifically focusing on the habitats of community importance designated under the Habitats Directive, hence including all wetland habitat types therein. It commits Member States to put in place necessary restoration measures on at least 30% of their total area that is not in good condition by 2030, at least 60% by 2040 and at least 90% by 2050. Additional numeric targets are set to re-establish protected habitat types in areas where they do not occur, in order to reach the 'favorable reference area' necessary to ensure their long-term viability.

Article 5 mandates the restoration of marine ecosystems, also setting numerical and time-bound restoration targets for different groups thereof. The list of marine habitat types targeted by the NRR is more comprehensive and detailed than those covered by the Habitats Directive. Since data availability on some of these is still limited, Article 5 also includes step-wise targets for Member States to enhance their knowledge of the respective ecosystem conditions. Article 9 focuses on restoring the natural connectivity of rivers and the natural functions of related floodplains. It commits Member States to identify and remove obsolete artificial barriers, with the objective of restoring at least 25 000 km free-flowing rivers in the EU by 2030 (see also Stoffers et al. 2026). The definition provided for 'free flowing rivers' in the NRR comprises longitudinal, lateral and vertical connectivity (Article 3 (22)), thus going beyond the Water Framework Directive's longitudinal focus.

Article 11 presents targets for the restoration of agricultural ecosystems. Most relevant in the context of wetland restoration are the targets on the restoration of drained peatlands in agricultural use. However, only a fraction of the mandated restoration measures need to focus on rewetting. For example, by 2030 measures shall be in place to restore 30% of such areas, of which at least a quarter shall be rewetted.

To implement the regulation, each Member State must develop and submit a draft National Restoration Plan (NRP) until 1 September 2026. To develop these area-specific plans, each Member State must identify and list the areas in need of restoration. The required content of the NRPs is listed in Article 15 of the NRR. NRPs must specify the measures that will be taken to meet the obligations, the financial resources required as well as the intended means of financing. Addi-

tionally, the NRPs must include "the estimated co-benefits for climate change mitigation and land degradation neutrality associated with the restoration measures over time" while considering "the potential of restoration measures to minimize climate change impacts on nature, to prevent or mitigate the effects of natural disasters and to support adaptation" (Art. 15 (3) (r) and (t) (ii)). Hence, the NRR promotes win-win scenarios for both biodiversity and the climate. The NRPs also need to demonstrate identified synergies with other sectoral policies such as forestry, agriculture, renewable energy and more – as well as an indication of subsidies which will negatively affect the NRR's implementation (Art. 15 (3) (v)).

By requiring such detailed information in the NRPs, for example on specified areas, the NRR aims to avoid the same implementation challenges as described in the investigated policies above. EU monitoring and reporting mechanisms are in place to support implementation.

Overall, the new EU Nature Restoration Regulation represents a milestone of EU biodiversity policy. It has garnered broad support from scientists, civil society organizations, businesses, activists, and others (Hering et al. 2023). Yet its adoption also faced significant challenges and political opposition, partially fuelled by misinformation and inaccurate claims (Pe'er et al. 2025). The EU Commission's original proposal, presented in June 2022, underwent revisions that softened some of its initial targets and requirements to gain broader support (including e.g. lower commitments for rewetting drained peatlands in agricultural use). A provisional trilogue agreement was reached in November 2023, yet, remarkably, the law's adoption by the European Parliament and Council remained uncertain even afterwards. Yet both decisive votes were passed in February and June of 2024 respectively, and the adopted Nature Restoration Regulation entered into force soon after.

The NRR holds potential to substantially enhance the condition of Europe's degraded ecosystems. It will be serving as a focal point for existing legislation, unifying various EU laws, and introducing novel binding targets which are to be implemented by set deadlines. As presented in Fig. 2 (and elaborated further by Hering et al. 2023), the law supports the implementation of the Nature Directives by defining deadlines, setting additional targets and providing implementation tools. Synergies with the Water Framework Directive and Marine Strategy Framework Directive are also promoted, e.g. through NRR targets and measures to enhance river connectivity and restore freshwater and marine ecosystems.

Fig. 2 visualizes how many different EU policies already promote wetland restoration in Europe (marked in green), showcasing opportunities for streamlining resources and pursuing win-win solutions. It should be noted that the figure only includes legally binding EU policy instruments. Yet as the brief examination of the EU Biodiversity Strategy above has shown, the NRR also holds a great potential to realize synergies with other, non-binding EU policies. For example, both the EU Green Infrastructure Strategy and the EU Climate Adaptation Strategy promote the implementation of nature-based solutions. Their targets could be advanced with concrete measures specified in National Restoration Plans.

With specific regard to wetlands, the new EU Water Resilience Strategy must also be mentioned, as presented by the EU Commission in June 2025. The strategy underlines the importance of restoring wetlands from source to sea in order to restore the broken water cycle and increase water retention on land, acknowledging wetlands as "nature's most effective water managers" (EC 2025). While largely lacking numerical targets, the Commission commits to launch a

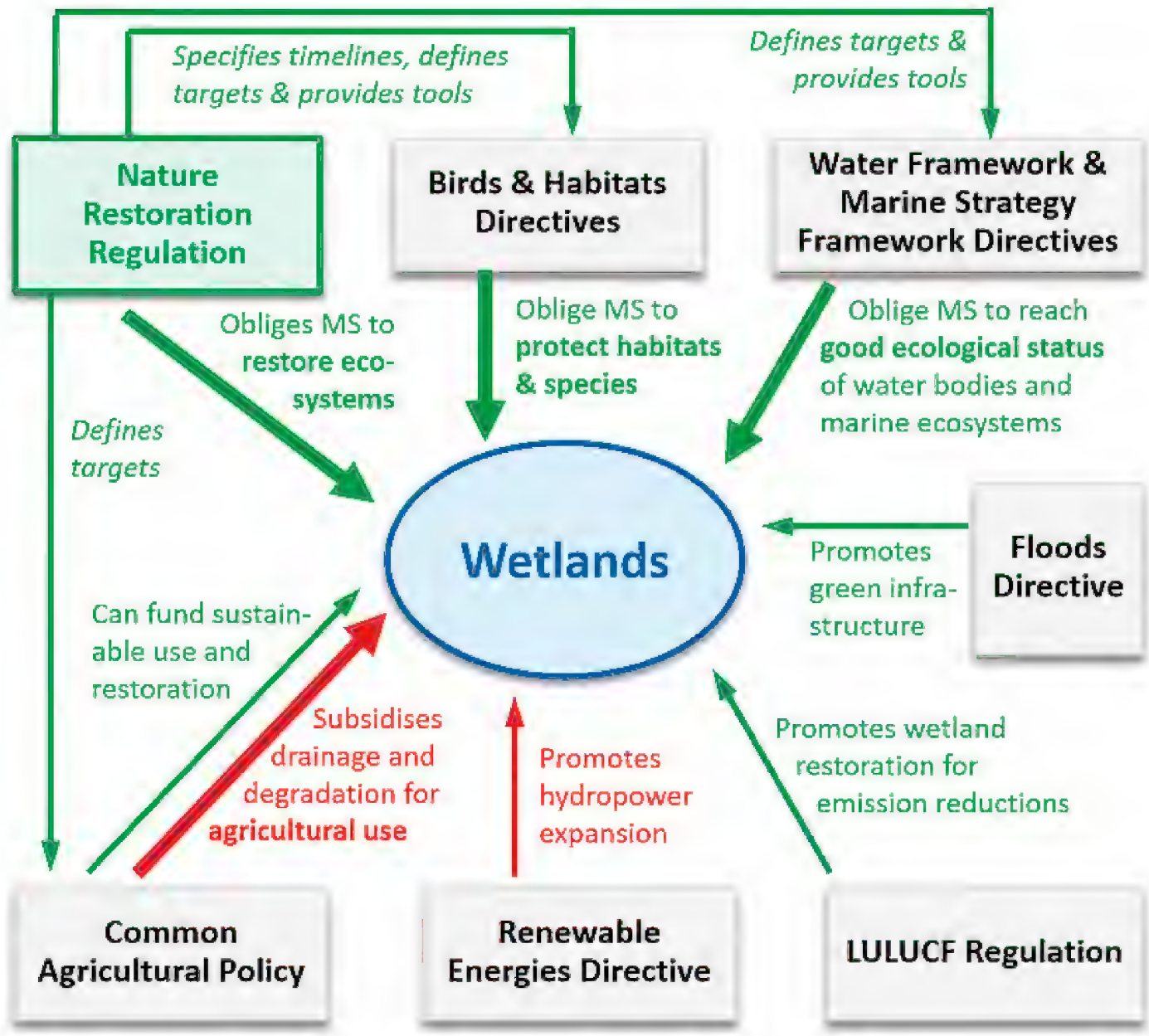

Figure 2. Selected binding EU policies and their influence on European wetlands, after the adoption of the EU Nature Restoration Regulation. Positive impacts are denoted in green, negative impacts on wetland health are marked in red. (Own compilation.)

"Green and Blue Corridors initiative", set up a "Sponge facility" and to "Significantly scale up investment in nature-based solutions" (EC 2025). All of these strategic commitments will certainly hold potential synergies with NRR implementation.

Regarding the global policy arena, implementing the NRR will directly contribute to realizing the EU's commitments under the internationally agreed Global Biodiversity Framework, giving the EU the chance of becoming a global leader in ecosystem restoration.

Now, the NRR's success and transformative impact hinge on effective implementation by EU Member States. For this, it is key to win support by national policy-makers across all relevant sectors, as well as land users, land owners and the wider public. A whole-of-government and whole-of-society approach will be crucial for writing, funding and successfully implementing comprehensive National Restoration Plans.

Outlook

While the previous EU Presidency and legislative period enacted the EU Green Deal that put environmental issues and biodiversity higher on the policy agenda than ever before (Wulf 2024), political priorities for the current Presidency have shifted dramatically. The Green Deal is now followed by a Clean Industrial Deal focussing on competitiveness and circularity, and defence and security issues have gained significant attention. Throughout 2025, the EU Commission has launched a series

of Omnibus packages to simplify EU legislation and reduce administrative burdens, including proposals to delay application, restrict the scope or weaken many recently-adopted Green Deal policies. Moreover, the Commission's proposal for the upcoming Multiannual Financial Framework for 2028–2034 suggests a fundamental reform of the CAP, which lacks a ringfenced minimum budget for agri-environmental schemes and replaces the enhanced conditionality and previously binding GAEC environmental standards with a 'farm stewardship' system offering even more flexibility to Member States. According to environmental NGOs, this proposal falls short of the requirements for a sustainable Europe (DNR 2025).

Yet, upholding the EU's environmental ambitions and commitments remains as crucial as ever. Without rapid and large-scale nature restoration action, biodiversity loss and ecosystem degradation will continue, depriving us of vital ecosystem services that underpin functioning societies and economies. The report on Europe's environment 2025 emphasizes that biodiversity is declining across terrestrial, freshwater and marine ecosystems in Europe due to persistent pressures (EEA 2025a). The European Climate Risk Assessment underlines that climate change impacts grow ever more severe in Europe, threatening food security, human health, ecosystems, infrastructure and economy (EEA 2024a). Many climate risks are related to water, including devastating droughts as well as heavy precipitations and catastrophic floods. The recent report on the State of Water in the EU highlights the need to restore aquatic ecosystems and wetlands at landscape scale, in order to make use of their natural ability to buffer extremes, reduce flood risks and retain water in the landscape (EEA 2024b).

In this political climate, the implementation of the Nature Restoration Regulation commences. Despite its legally binding targets, success will depend on social acceptance, political will and the provision of sufficient resources for its implementation, including suitable funding schemes (Hering et al. 2023). Since a high competition for resources and political attention must be expected, it is pertinent to emphasize synergy potentials in political communications and showcase the multiple benefits that nature restoration provides. This is already integrated into the Regulation text in that in the NRR's very first article it says that the Regulation does not only contribute to "the long-term and sustained recovery of biodiverse and resilient ecosystems", but also to "achieving the Union's overarching objectives concerning climate change mitigation, climate change adaptation and land degradation neutrality" and "enhancing food security" (Regulation (EU) 2024/1991, Art. 1 (1)).

Wetlands offer a very tangible and easily understandable example for such multifunctionality (see also Stammel et al. 2026 on how to measure their multiple ecosystem services). Yet the vital contributions that wetlands provide to people are not yet sufficiently recognized in other policy sectors, including climate, energy and agriculture. To make full use of synergy potentials, prevent counteracting measures and spend resources more efficiently, policy integration and coherence must be actively pursued (see also Fey et al. 2025). In the case of wetlands, this includes strengthening co-benefits and minimizing trade-offs with water management and water resilience polices, coastal defence plans, urban and rural spatial planning, agricultural subsidies, renewable energies and hydropower expansion, as well as climate change mitigation, climate adaptation and disaster risk reduction plans, among others. Scaling up wetland restoration in Europe through holistic implementation of the NRR is one crucial and urgent step

in this direction. Yet restoration action also needs to be complemented by more systemic transformations in the sectors currently driving wetland degradation. A transformative change for wetlands is needed in Europe (ENCA 2023).

Additional information

Conflict of interest

The authors have declared that no competing interests exist.

Ethical statement

No ethical statement was reported.

Use of AI

No use of AI was reported.

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Author contributions

Conceptualization and overarching goals and aim of the manuscript were done by Carla Klusmann, Katrina Marsden and Simone Wulf. All authors contributed to the writing, review and editing of the manuscript. All authors discussed the results and contributed to the final manuscript.

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Data availability

All of the data that support the findings of this study are available in the main text or Supplementary Information.

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